UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,561	08/19/2003	Hsueh-Yuan Pao	IL-11028	6617

7590 05/17/2006

Deputy Laboratory Counsel For Intellectual Property
Lawrence Livermore National Laboratory
P.O. Box 808, L-703
Livermore, CA 94551

EXAMINER
FILE, ERIN M

ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/644,561	PAO ET AL.
	Examiner	Art Unit	
	Erin M. File	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _17 February 2006_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-12_ is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-12_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _06 June 2005_ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some *   c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau. (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
     Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
     Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

U.S. Patent and Trademark Office

PTOL-326 (Rev. 7-05)   Office Action Summary   Part of Paper No./Mail Date 04202006

DETAILED ACTION

1.   In view of the appeal brief filed on February 17, 2006, PROSECUTION IS

HEREBY REOPENED. A non-final rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the

following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply

under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31. A new

notice of appeal fee and appeal brief fee will not be required for applicant to appeal from

the new Office action. Any appeal brief filed on or after September 13, 2004 must

comply with 37 CFR 41.37.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Zhang and in further view of McCullough.

Claim 1, 7, 12, Zhang discloses a serial-to-parallel data converter which converts a

string of serial data to a plurality of parallel data (fig. 1, 21), an in-phase/quadrature

mapper that receives parallel data and determines its I and Q locations (fig. 2, 47, col. 5,

lines 21-40), a plurality of look-up-tables (LUTs) operatively connected to receive and

store said I and Q locations, wherein the in-phase LUTs are configured I_1 to I_N, and

quadrature LUTs are configured Q_1 to Q_X (abstract, fig. 6B, col. 5, lines 21-40);   adders

are used to create data streams of each of I and Q locations stored within data buffers,

registers to collect and store IQ_1 to IQ_{IQN} (col. 5, lines 10-46); a digital to analog

converter operatively connected to convert said output data comprising IQ_1 to IQ_{IQN} to

analog data (fig. 2, 53). Zhang further teaches the data is configured A_1 to A_{AN}, for each

of I and Q added to produce IQ data (fig. 7, col. 6 line 62-col. 7 line 7). Zhang fails to

disclose a quadrature amplitude modulator which does not include a multiplier,

McCullough discloses an architecture for a universal modulator which can function in a

variety of modes including QAM without the use of multipliers (fig. 1, col. 1, lines 21-30).

Zhang teaches a quadrature amplitude modulator which meets all of the limitations of

the disclosed invention, and further teaches his invention significantly reduces the

number of multipliers (abstract). McCullough teaches a modulator which can function in

a variety of modes including quadrature amplitude modulation and does not disclose the

use of any modulators. The use of multipliers is computationally intensive. Zhang's

disclosure teaches away from the use of multipliers in his modulation technique,

claiming an increase in the efficiency of the modulation. For these reasons it would be

obvious to one skilled in the art at the time of invention to incorporate McCullough's

modulation technique into Zhang's invention.

Claims 2, 8, 10, Zhang discloses a serial-to-parallel data converter which converts a

string of serial data to a plurality of parallel data (fig. 1, 21); in-phase/quadrature mapper

that receives parallel data and determines its I and Q locations (fig. 2, 47, col. 5, lines

21-40); a plurality of look-up-tables (LUTs) operatively connected to receive and store

said I and Q locations, wherein the in-phase LUTs are configured I_1 to I_N, and

quadrature LUTs are configured Q_1 to Q_X (abstract, fig. 6B, col. 5, lines 21-40); a

adders to receive and add I and Q locations stored within LUTs, wherein adders are

configured A_1 to A_{AN}, wherein each I and Q having a particular subscript are added in

the adder having the same subscript to produce output data comprising IQ_1 to IQ_{IQN} (fig.

6B); registers to collect and store IQ_1 to IQ_{IQN} (col. 5, lines 10-46); at least one

multiplexer to collect from registers the subscript output data comprising only odd

subscript output data from said output data comprising IQ_1 to IQ_{IQN} (fig. 3B); at least one

multiplexer to collect from said plurality of registers the subscript output data comprising

only even subscript output data from said output data comprising IQ_1 to IQ_{IQN} (fig. 3A);

and a digital to analog converter operatively connected to convert said odd subscript

data and said even subscript data to analog data (fig. 2, 53). Zhang fails to disclose a

quadrature amplitude modulator which does not include a multiplier, McCullough

discloses an architecture for a universal modulator which can function in a variety of

modes including QAM without the use of multipliers (abstract). Zhang teaches a

quadrature amplitude modulator which meets all of the limitations of the disclosed

invention, and further teaches his invention significantly reduces the number of

multipliers (abstract). McCullough teaches a modulator which can function in a variety of

modes including quadrature amplitude modulation and does not disclose the use of any

modulators. Because of Zhang's disclosure teaches away from the use of multipliers in

his modulation technique, claiming an increase in the efficiency of the modulation, it

would be obvious to one skilled in the art at the time of invention to incorporate

McCullough's modulation technique into Zhang's invention.

Claims 3, 5, 9, 11, Zhang meets all the limitations of claims 3, 5, 9, and 11, (see above

paragraphs) except disclosing the exact multiplexer configuration wherein nx2

multiplexers are used. At the time the invention was made, it would have been obvious

to a person of ordinary skill in the art to use various permutations of multiplexers since it

is well-known in the art that there are multiple ways to translate multiple signals into one

output. For instance, Zhang could use two 4x2 and two 2x1 multiplexers to substitute for

one 8x1 multiplexer. In addition, applicant has not disclosed that nx2 multiplexers

provides an advantage, is used for a particular purpose, or solves a stated problem.

One of ordinary skill in the art, furthermore, would have expected Applicant's invention

to perform equally well with one 8x1 multiplexer because it would reduce FPGA

programming complexity. Therefore, it would have been obvious to one of ordinary skill

in this art to modify Zhang to obtain the invention as specified in claims 3, 5, 9, and 11.

Claim 4, Zhang discloses a plurality of look-up-tables (LUTs) operatively connected to

receive and store said I and Q locations, wherein the in-phase LUTs are configured I_1 to

I_N, and quadrature LUTs are configured Q_1 to Q_X (abstract, fig. 6B, col. 5, lines 21-40);

a adders to receive and add I and Q locations stored within LUTs, wherein adders are

configured A_1 to A_{AN}, wherein each I and Q having a particular subscript are added in

the adder having the same subscript to produce output data comprising IQ_1 to IQ_{IQN} (fig.

6B); registers to collect and store IQ_1 to IQ_{IQN} (col. 5, lines 10-46); at least one

multiplexer to collect from registers the subscript output data comprising only odd

subscript output data from said output data comprising IQ_1 to IQ_{IQN} (fig. 3B); at least one

multiplexer to collect from said plurality of registers the subscript output data comprising

only even subscript output data from said output data comprising IQ_1 to IQ_{IQN} (fig. 3A);

and a digital to analog converter operatively connected to convert said odd subscript

data and said even subscript data to analog data (fig. 2, 53). Zhang fails to disclose a

quadrature amplitude modulator which does not include a multiplier, McCullough

discloses an architecture for a universal modulator which can function in a variety of

modes including QAM without the use of multipliers (abstract). Zhang teaches a

quadrature amplitude modulator which meets all of the limitations of the disclosed

invention, and further teaches his invention significantly reduces the number of

multipliers (abstract). McCullough teaches a modulator which can function in a variety of

modes including quadrature amplitude modulation and does not disclose the use of any

modulators. Because of Zhang's disclosure teaches away from the use of multipliers in

his modulation technique, claiming an increase in the efficiency of the modulation, it

would be obvious to one skilled in the art at the time of invention to incorporate

McCullough's modulation technique into Zhang's invention.

Claim 6, Zhang discloses a plurality of look-up-tables (LUTs) operatively connected to

receive and store said I and Q locations, wherein the in-phase LUTs are configured I_1 to

I_N, and quadrature LUTs are configured Q_1 to Q_X (abstract, fig. 6B, col. 5, lines 21-40);

a adders to receive and add I and Q locations stored within LUTs, wherein adders are

configured A_1 to A_{AN}, wherein each I and Q having a particular subscript are added in

the adder having the same subscript to produce output data comprising IQ_1 to IQ_{IQN} (fig.

7, col. 6 line 62-col. 7 line 7); registers to collect and store IQ_1 to IQ_{IQN} (col. 5, lines 10-

46); a digital to analog converter operatively connected to convert said odd subscript

data and said even subscript data to analog data (fig. 2, 53). Zhang fails to disclose a

quadrature amplitude modulator which does not include a multiplier, McCullough

discloses an architecture for a universal modulator which can function in a variety of

modes including QAM without the use of multipliers (abstract). Zhang teaches a

quadrature amplitude modulator which meets all of the limitations of the disclosed

invention, and further teaches his invention significantly reduces the number of

multipliers (abstract). McCullough teaches a modulator which can function in a variety of

modes including quadrature amplitude modulation and does not disclose the use of any

modulators. Because of Zhang's disclosure teaches away from the use of multipliers in

his modulation technique, claiming an increase in the efficiency of the modulation, it

would be obvious to one skilled in the art at the time of invention to incorporate

McCullough's modulation technique into Zhang's invention.

Conclusion

4.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Erin M. File whose telephone number is (571)272-6040.

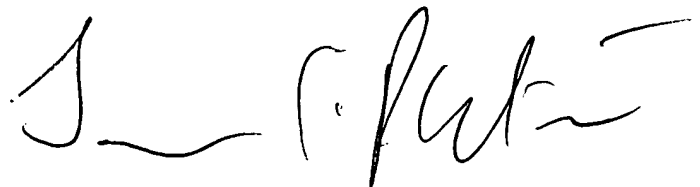The examiner can normally be reached on M-F 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone

number for the organization where this application or proceeding is assigned is 571-

273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Erin M. File

4/21/2006

JAY K. PATEL
SUPERVISORY PATENT EXAMINER